

<110> JAPAN TOBACCO INC. and NORINSUISAN-SENTANGIJYUTU SANGYOUSHIKOU  
CENTOR

<120> A novel protein, a gene coding therefor and a method of using the same

<130> PC/N(x)-61-17

&lt;160&gt; 12

 $\langle 210 \rangle$  1

<211> 2106

## <212> DNA

〈213〉 *Lyophyllum shimeji*

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$\langle 221 \rangle$  CDS

**<222> (8)... (1861)**

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1

5

10

tct atg caa atc aac/gga cag att cct aag aac gca att cac gaa aca 97

Ser Met Gln Ile Asn Gly Gln Ile Pro Lys Asn Ala Ile His Glu Thr

15

20

25

30

tac gga aac gac gga gtt gat gta ttc att gca gga tct gga ccc att 145

Tyr Gly Asn ~~Asp~~ Gly Val Asp Val Phe Ile Ala Gly Ser Gly Pro Ile

35

40

45

gga gcg /acg tat gca aag ctc tgt gtt gaa gct ggt cta cgt gtt gtg 193

Gly	Ala	Thr	Tyr	Ala	Lys	Leu	Cys	Val	Glu	Ala	Gly	Leu	Arg	Val	Val	
50								55				60				
atg	gtc	gag	atc	gga	gct	gct	gat	agc	ttc	tac	gct	gtt	aat	gcc	gaa	241
Met	Val	Glu	Ile	Gly	Ala	Ala	Asp	Ser	Phe	Tyr	Ala	Val	Asn	Ala	Glu	
65								70				75				
gaa	gga	act	gca	gtt	ccc	tac	gtt	cct	ggc	tac	cac	aag	aag	aat	gaa	289
Glu	Gly	Thr	Ala	Val	Pro	Tyr	Val	Pro	Gly	Tyr	His	Lys	Lys	Asn	Glu	
80								85				90				
atc	gag	ttc	cag	aaa	gat	att	gac	cgc	ttc	gtc	aat	gta	atc	aag	gga	337
Ile	Glu	Phe	Gln	Lys	Asp	Ile	Asp	Arg	Phe	Val	Asn	Val	Ile	Lys	Gly	
95								100				105				110
gcc	tta	caa	caa	gtc	tct	gtt	cct	gtc	aga	aac	cag	aac	gtg	cct	aca	385
Ala	Leu	Gln	Gln	Val	Ser	Val	Pro	Val	Arg	Asn	Gln	Asn	Val	Pro	Thr	
115								120				125				
ctt	gat	ccc	gga	gcc	tgg	agc	gcg	ccc	cct	gga	agt	tca	gcc	ata	tcg	433
Leu	Asp	Pro	Gly	Ala	Trp	Ser	Ala	Pro	Pro	Gly	Ser	Ser	Ala	Ile	Ser	
130								135				140				
aac	ggt	aaa	aat	cct	cac	cag	cgg	gaa	ttc	gag	aac	ttg	tct	gcg	gag	481
Asn	Gly	Lys	Asn	Pro	His	Gln	Arg	Glu	Phe	Glu	Asn	Leu	Ser	Ala	Glu	
145								150				155				
gcc	gta	acg	cgt	gga	gtc	ggc	ggc	atg	agt	acc	cac	tgg	acg	tgc	tcc	529
Ala	Val	Thr	Arg	Gly	Val	Gly	Gly	Met	Ser	Thr	His	Trp	Thr	Cys	Ser	
160								165				170				
acg	cca	cgg	att	cat	cca	ccc	atg	gaa	agt	ctc	ccg	ggc	atc	ggc	cgt	577
Thr	Pro	Arg	Ile	His	Pro	Pro	Met	Glu	Ser	Leu	Pro	Gly	Ile	Gly	Arg	
175								185				190				
ccg	aag	ctc	agt	aac	gac	ccg	gca	gag	gac	gac	aaa	gag	tgg	aac	gag	625
Pro	Lys	Leu	Ser	Asn	Asp	Pro	Ala	Glu	Asp	Asp	Lys	Glu	Trp	Asn	Glu	
195								200				205				

ctt tat tcc gag gcc gag cgt ctc atc ggg act tcc acc aag gaa ttc 673  
 Leu Tyr Ser Glu Ala Glu Arg Leu Ile Gly Thr Ser Thr Lys Glu Phe  
 210 215 220  
 gag gag tca att cgg cac acc ctt gtt ctg cgc tct ttg caa gac gcg 721  
 Asp Glu Ser Ile Arg His Thr Leu Val Leu Arg Ser Leu Gln Asp Ala  
 225 230 235  
 tac aag gat cgt caa cgt atc ttt cgc cct ctc ccg ttg gca tgc cac 769  
 Tyr Lys Asp Arg Gln Arg Ile Phe Arg Pro Leu Pro Leu Ala Cys His  
 240 245 250  
 cgg ttg aag aac gcg ccg gaa tac gtc gaa tgg cac tca gca gaa aat 817  
 Arg Leu Lys Asn Ala Pro Glu Tyr Val Glu Trp His Ser Ala Glu Asn  
 255 260 265 270  
 ctt ttc cac tct atc tac aac gat gac aag cag aag aag ctc ttt acc 865  
 Leu Phe His Ser Ile Tyr Asn Asp Asp Lys Gln Lys Lys Leu Phe Thr  
 275 280 285  
 ctg ctg acg aac cat cgc tgc acc cga ctg gcg ctt acg ggc ggg tat 913  
 Leu Leu Thr Asn His Arg Cys Thr Arg Leu Ala Leu Thr Gly Gly Tyr  
 290 295 300  
 gag aag aag att ggc gct gcc gag gtc agg aat cta ctg gcc acc agg 961  
 Glu Lys Lys Ile Gly Ala Ala Glu Val Arg Asn Leu Leu Ala Thr Arg  
 305 310 315  
 aat cct agt tgc cag ctg gac agc tat atc atg gcg aag gta tat gta 1009  
 Asn Pro Ser Ser Gln Leu Asp Ser Tyr Ile Met Ala Lys Val Tyr Val  
 320 325 330  
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 Leu Ala Ser Gly Ala Ile Gly Asn Pro Gln Ile Leu Tyr Asn Ser Gly  
 335 340 345 350  
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 Phe Ser Gly Leu Gln Val Thr Pro Arg Asn Asp Ser Leu Ile Pro Asn



Met Ala Asp Met Cys Glu Val Ala Ser Asn Leu Gly Gly Tyr Leu Pro  
 515 520 525  
 acg tcc ccc ccg cag ttt atg gat cca ggc ctt gca ctt cat ctt gcg 1633  
 Thr Ser Pro Pro Gln Phe Met Asp Pro Gly Leu Ala Leu His Leu Ala  
 530 535 540  
 ggg act act cgc att ggc ttc gac aag gca act aca gtg gct gat aac 1681  
 Gly Thr Thr Arg Ile Gly Phe Asp Lys Ala Thr Thr Val Ala Asp Asn  
 545 550 555  
 aac tcg ctg gtc tgg gac ttt gcc aat ctt tat gtt gca ggc aat ggc 1729  
 Asn Ser Leu Val Trp Asp Phe Ala Asn Leu Tyr Val Ala Gly Asn Gly  
 560 565 570  
 acc atc agg acg ggc ttc ggc gag aac ccg aca ctt acg tcg atg tgc 1777  
 Thr Ile Arg Thr Gly Phe Gly Glu Asn Pro Thr Leu Thr Ser Met Cys  
 575 580 585 590  
 cac gct atc aag agc gcg agg agc atc atc aat aca ctc aag ggt ggg 1825  
 His Ala Ile Lys Ser Ala Arg Ser Ile Ile Asn Thr Leu Lys Gly Gly  
 595 600 605  
 act gac gga aaa aat aca ggc gag cat cgc aac ctt tga ggaaggagca ac 1876  
 Thr Asp Gly Lys Asn Thr Gly Glu His Arg Asn Leu  
 610 615 618  
 agcagtgttaa acaaacgcgt caagtggcta ctccaagtig aatgcattct ggtcccctac 1936  
 catgttgatg tglacgatag gcgttgaaag attttigtga ttactgaacc tgtactttgt 1996  
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<210> 2

<211> 618

<212> PRT

<213> Lyophyllum shimeji

<400> 2

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20 25 30  
Tyr Gly Asn Asp Gly Val Asp Val Phe Ile Ala Gly Ser Gly Pro  
35 40 45  
Ile Gly Ala Thr Tyr Ala Lys Leu Cys Val Glu Ala Gly Leu Arg  
50 55 60  
Val Val Met Val Glu Ile Gly Ala Ala Asp Ser Phe Tyr Ala Val  
65 70 75  
Asn Ala Glu Glu Gly Thr Ala Val Pro Tyr Val Pro Gly Tyr His  
80 85 90  
Lys Lys Asn Glu Ile Glu Phe Gln Lys Asp Ile Asp Arg Phe Val  
95 100 105  
Asn Val Ile Lys Gly Ala Leu Gln Gln Val Ser Val Pro Val Arg  
110 115 120  
Asn Gln Asn Val Pro Thr Leu Asp Pro Gly Ala Trp Ser Ala Pro  
125 130 135  
Pro Gly Ser Ser Ala Ile Ser Asn Gly Lys Asn Pro His Gln Arg  
140 145 150  
Glu Phe Glu Asn Leu Ser Ala Glu Ala Val Thr Arg Gly Val Gly  
155 160 165  
Gly Met Ser Thr His Trp Thr Cys Ser Thr Pro Arg Ile His Pro  
170 175 180  
Pro Met Glu Ser Leu Pro Gly Ile Gly Arg Pro Lys Leu Ser Asn  
185 190 195  
Asp Pro Ala Glu Asp Asp Lys Glu Trp Asn Glu Leu Tyr Ser Glu

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200	205	210
Ala Glu Arg Leu Ile Gly Thr Ser Thr	Lys Glu Phe Asp Glu Ser	
215	220	225
Ile Arg His Thr Leu Val Leu Arg Ser	Leu Gln Asp Ala Tyr Lys	
230	235	240
Asp Arg Gln Arg Ile Phe Arg Pro Leu	Pro Leu Ala Cys His Arg	
245	250	255
Leu Lys Asn Ala Pro Glu Tyr Val Glu	Trp His Ser Ala Glu Asn	
260	265	270
Leu Phe His Ser Ile Tyr Asn Asp Asp	Lys Gln Lys Lys Leu Phe	
275	280	285
Thr Leu Leu Thr Asn His Arg Cys Thr	Arg Leu Ala Leu Thr Gly	
290	295	300
Gly Tyr Glu Lys Lys Ile Gly Ala Ala	Glu Val Arg Asn Leu Leu	
305	310	315
Ala Thr Arg Asn Pro Ser Ser Gln Leu	Asp Ser Tyr Ile Met Ala	
320	325	330
Lys Val Tyr Val Leu Ala Ser Gly Ala	Ile Gly Asn Pro Gln Ile	
335	340	345
Leu Tyr Asn Ser Gly Phe Ser Gly Leu	Gln Val Thr Pro Arg Asn	
350	355	360
Asp Ser Leu Ile Pro Asn Leu Gly Arg	Tyr Ile Thr Glu Gln Pro	
365	370	375
Met Ala Phe Cys Gln Ile Val Leu Arg	Gln Glu Phe Val Asp Ser	
380	385	390
Val Arg Asp Asp Pro Tyr Gly Leu Pro	Trp Trp Lys Glu Ala Val	
395	400	405
Ala Gln His Ile Ala Lys Asn Pro Thr	Asp Ala Leu Pro Ile Pro	
410	415	420

Phe Arg Asp Pro Glu Pro Gln Val Thr Thr Pro Phe Thr Glu Glu	425	430	435
His Pro Trp His Thr Gln Ile His Arg Asp Ala Phe Ser Tyr Gly	440	445	450
Ala Val Gly Pro Glu Val Asp Ser Arg Val Ile Val Asp Leu Arg	455	460	465
Trp Phe Gly Ala Thr Asp Pro Glu Ala Asn Asn Leu Leu Val Phe	470	475	480
Gln Asn Asp Val Gln Asp Gly Tyr Ser Met Pro Gln Pro Thr Phe	485	490	495
Arg Tyr Arg Pro Ser Thr Ala Ser Asn Val Arg Ala Arg Lys Met	500	505	510
Met Ala Asp Met Cys Glu Val Ala Ser Asn Leu Gly Gly Tyr Leu	515	520	525
Pro Thr Ser Pro Pro Gln Phe Met Asp Pro Gly Leu Ala Leu His	530	535	540
Leu Ala Gly Thr Thr Arg Ile Gly Phe Asp Lys Ala Thr Thr Val	545	550	555
Ala Asp Asn Asn Ser Leu Val Trp Asp Phe Ala Asn Leu Tyr Val	560	565	570
Ala Gly Asn Gly Thr Ile Arg Thr Gly Phe Gly Glu Asn Pro Thr	575	580	585
Leu Thr Ser Met Cys His Ala Ile Lys Ser Ala Arg Ser Ile Ile	590	595	600
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Arg Asn Leu			

618



<210> 3

<211> 30

<212> PRT

<213> Lyophyllum shimeji

<400> 3

Asn Ala Glu Glu Gly Thr Ala Val Pro Tyr Val Pro Gly Tyr His

1 5 10 15

Lys Lys Asn Glu Ile Glu Phe Gln Lys Asp Ile Asp Arg Phe Val

20 25 30

<210> 4

<211> 24

<212> PRT

<213> Lyophyllum shimeji

<400> 4

Glu Phe Asp Glu Ser Ile Arg His Thr Leu Val Leu Arg Ser Leu

1 5 10 15

Gln Asp Ala Tyr Lys Asp Arg Gln Arg

20 24

<210> 5

<211> 29

<212> PRT

<213> Lyophyllum shimeji

<400> 5

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Leu	Val	Leu	Arg
Ser	Leu	Gln	Asp
Ala	Tyr		
20	25	29	

<210> 6

<211> 34

<212> PRT

<213> Lyophyllum shimeji

<400> 6

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Ile	Arg	His	Thr	Leu	Val	Leu	Arg	Ser	Leu	Gln	Asp	Ala	Tyr	Lys
20	25	30												

Asp Arg Gln Arg  
34

<210> 7

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<222> 9, 12, 15 and 18

<223> i represents inosine

<400> 7

gargarggia cigcigticc 20

<210> 8

<211> 23

<212> DNA

<213> Artificial Sequence

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garttycara argayathga ymg 23

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<212> DNA

<213> Artificial Sequence

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<222> 6, 12 and 21

<223> i represents inosine

<400> 9

ttygtiaayg tiathtgygg igc 23

<210> 10

<211> 23

<212> DNA

<213> Artificial Sequence

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<222> 3 and 9

<223> i represents inosine

<400> 10

tgickdatis wytertcraa ytc 23

<210> 11

<211> 23

<212> DNA

<213> Artificial Sequence

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<223> i represents inosine

<400> 11

tgickrtcyt trtaigrtc ytg 23

<210> 12

<211> 23

<212> DNA

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